THE AUTOMOBILE SAFETY BELT FACT BOOK

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If every driver and passenger in the United States would wear safety belts during every trip in a car . . .

About 17,000 lives would be saved every year,

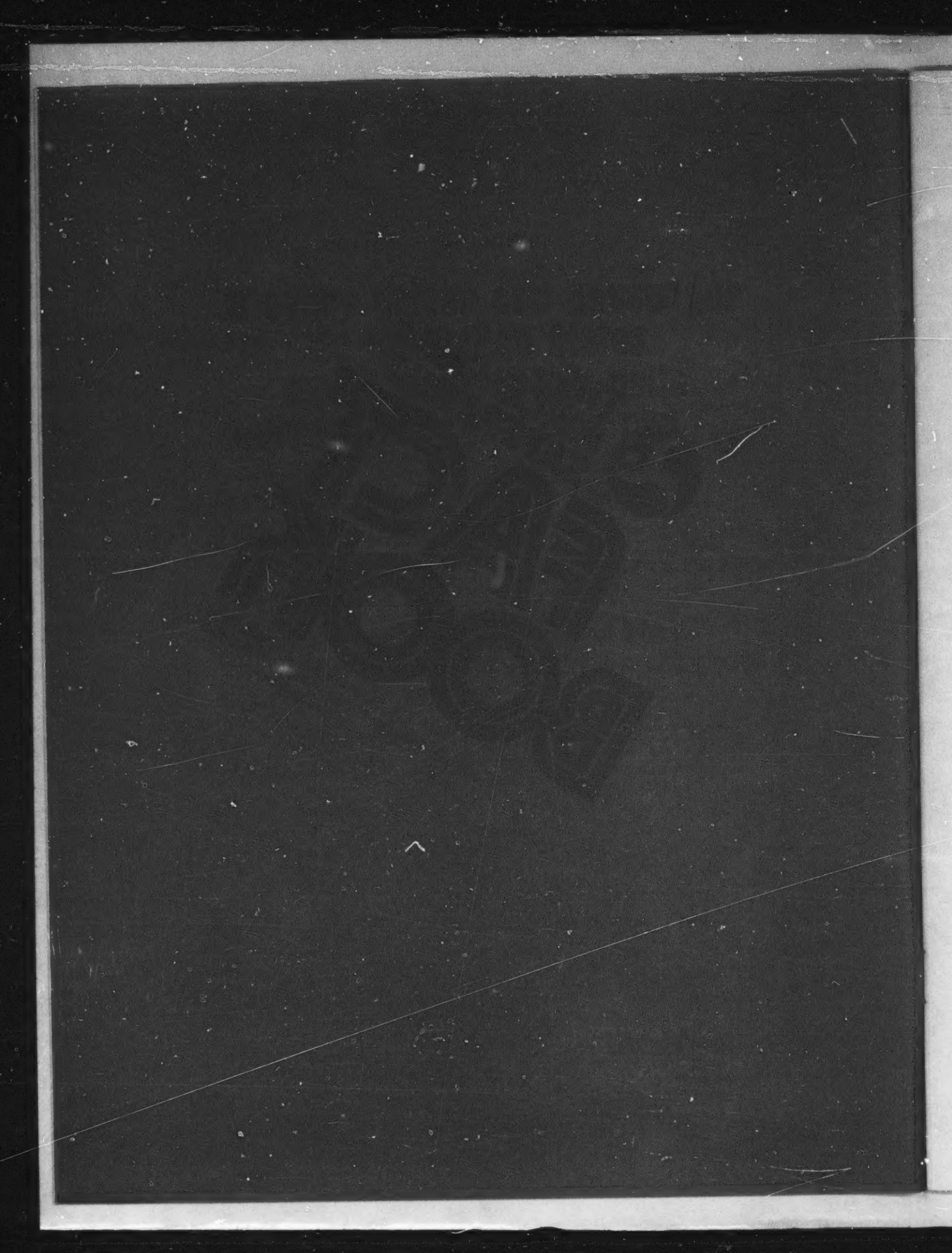
the severity of almost 4 million personal injuries would be reduced every year,

20 billion dollars in costs incurred through motor vehicle accidents would be substantially reduced every year and

the total number of motor vehicle accidents would probably decrease.

THE AUTOMOBILE SAFETY BELT FACT BOOK

U.S. Department of Transportation
National Highway Traffic Safety Administration
Washington, D.C. 20590



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Motor vehicle accidents are a

Every week, about 900 people in this country are killed in motor vehicle accidents. Every day, almost 10,000 others are injured on our streets and highways. Clearly, human tragedy resulting from motor vehicle accidents has become a major problem in the United States.

This problem is serious. It's a real life-and-death issue. And no one can escape facing the problem because accidents *don't* always happen to "somebody else."

Do you know that in the next ten years of normal driving, it's almost a certainty that YOU will be involved in a motor vehicle accident serious enough to injure or even kill you? You're taking a tremendous risk every time you get into an automobile — unless you're also taking action to protect yourself.

Right now, the simplest and most effective protection against possible injury or death in motor vehicle accidents is a fastened safety belt. Most automobiles on the road today are equipped with safety belts, but few people are performing the simple act of fastening those belts. The result is that far too many people are being injured or killed needlessly.

This booklet contains some hard and very persuasive facts about the protection fastened safety belts provide during motor vehicle accidents. These facts are important because the small amount of time you'll invest in reading them may save your life. You'll be finding out why you should buckle up before every automobile trip — and why you should then encourage others to buckle up, too.

life-and-death issue

Experts
are studying
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happens
during
automobile
crashes

For many years, experts and specialists have been studying automobile crashes to find out exactly what happens to both vehicles and victims. This data is collected by simulating real-world crashes under laboratory conditions and by carefully investigating crashes that occur in the real world.

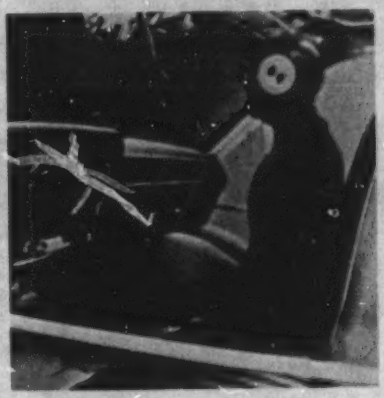
In the laboratory, accidents are simulated with test cars carrying life-like dummies. Experts study the effects of various types of crashes by crashing these test cars into each other and into concrete walls. Real-world accidents are also simulated in laboratory sled tests in which human volunteers and life-like dummies are seated in sled-like devices similar to a car's frame. The sleds are then run along a track and accurately controlled to accelerate and stop suddenly. Both types of tests are monitored with high-speed photography and other instruments. In the real world, trained teams of specialists carefully investigate actual crash scenes to determine how and why the accident occurred and to collect data on the effects of the accident. This booklet is based on results of laboratory and real-world crash studies such as these.

The Second Collision

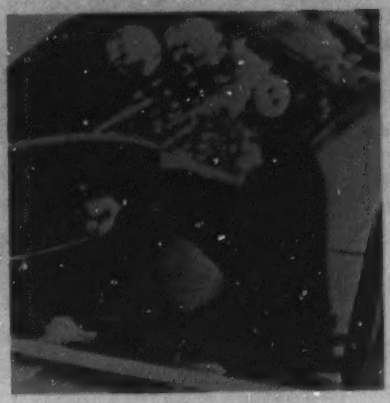
By studying automobile accidents, experts have found it is usually the second collision that injures and kills people. When one car hits another car or object, this is the first collision. The second collision occurs when unbelted occupants are thrown into the car's windshield, steering wheel, doors, dashboard or other hard interior surfaces. A car's interior is filled with hard surfaces, and these surfaces become instruments of death when people are thrown against them with the forces generated in an automobile crash.

The sequential photographs below show a laboratory simulation of an accident in which two cars, each travelling at 30 mph, crash head-on. The severity of the second collision is clearly illustrated as the car's occupant (a dummy, in this case) who is *not* wearing safety belts is thrown forward in the car.

Impact: This is the point of first collision. The laboratory vehicle begins to slow down, and in a real-world head-on collision, the front of the car would begin to crush.



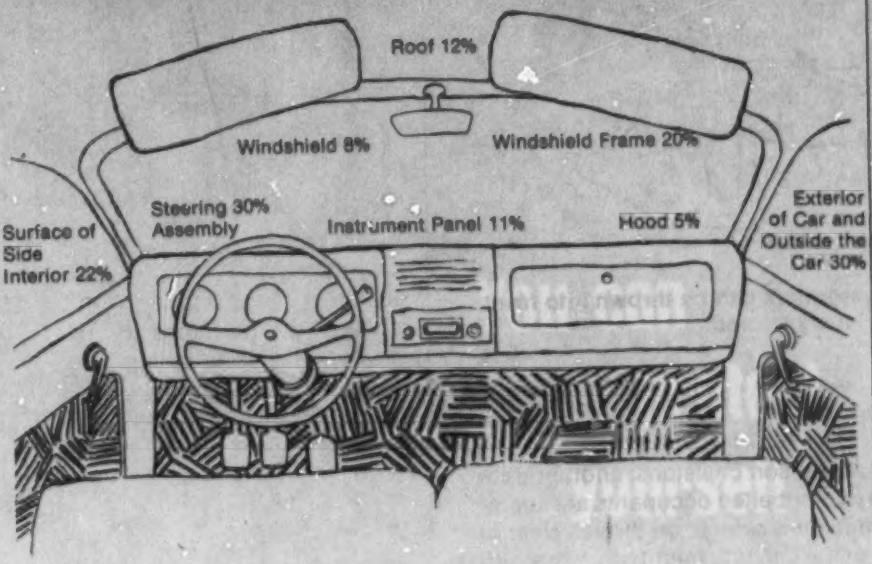
Within 1/10 of a second, the vehicle has come to a complete stop. The unbelted occupant, however, continues to move forward in the car at 30 mph.



The second collision: One-fiftieth of a second after the car has stopped, the unbelted occupant slams into the windshield. The forces on the occupant in this second collision are equivalent to those on a human body as it hits the ground after falling from a three-story building.

Without safety belts, you could become the victim of a second collision in any type of automobile crash. As the car rolls in a roll-over crash, for example, you would bounce back and forth against the car's roof, doors and floor. In a side impact crash, you would slide across the seat toward the point of impact and strike the car's door, side pillars or door windows. If the car were struck from behind, the force of the collision would press you against the back of your seat. The car seat would compress to absorb energy and provide protection, and if your head restraint were also properly adjusted, you might not be injured. But, without belts, you could rebound as the seat back decompressed, bounce forward and strike the front interior of the car.

In an effort to reduce injuries and fatalities from second collisions, certain safety features are now required in car interiors -- stronger windshields, collapsible steering wheels and padded dashboards, for example. Despite such improvements, you can still be injured or killed in a second collision with these surfaces. As the illustration shows, second collisions with steering wheels and windshields alone account for 38 per cent of the fatalities in automobile crashes.



Hard surfaces in a car's interior can become instruments of death during a crash. This illustration shows the percentage of unbelted occupants who are fatally injured in second collisions with various hard surfaces inside a car.

The photographs below show damage caused to car interiors by unbelted occupants who struck these surfaces during crashes.

These cars can be repaired or replaced, but what about the people who were in these cars?

Person-to-Person Collisions

Without your safety belt fastened during an accident, you can be seriously injured by being thrown into other people in the car as well as into the hard surfaces of the car's interior. Travelling unbelted in the rear seat of a car will not prevent second collisions or person-to-person collisions in the event of a crash.

If you were in the front seat during a head-on or frontal crash, you could be injured when unbelted rear-seat passengers were flung forward into you. If you were an unbelted rear-seat passenger, you could also be injured by being flung forward into someone else. In a side impact crash without safety belts, you would slide across the seat toward the point of impact, perhaps forcing another unbelted person out a window or door. You could also be the person forced out.

Riding with a child in your lap is especially dangerous. In a crash, your unbelted body could crush the child against some hard surface during the second collision. Even if you're wearing belts, collision forces are great enough to tear the child from your arms and throw him/her into a hard surface. This can also be caused by something as simple and frequent as a quick stop of the car. Children require special safety protection which is discussed in another section of this booklet.

During a crash, unbelted rear-seat passengers can be thrown into front-seat passengers, and both can be seriously injured.

Ejection from the Automobile

Besides second collisions and person-to-person collisions, another dangerous result of automobile crashes is that unbelted occupants are sometimes thrown out of the car. You may think it is safer to be thrown clear of the car during a crash. But to get clear of the car, you might crash through the windshield first. Or you might fly through a door into a roadside object or be scraped along the pavement — or both. After this, the car you were in could roll on top of you or another car could drive over you. Clearly, you are much safer if you remain inside the car during a crash. Your chances of being killed are 25 times greater if you are thrown out of the car.

Your chances of being killed are 25 times greater if you are thrown out of the car during a crash.

You can
protect
yourself
by
fastening
your
safety belt

Although research is going on to develop safer cars and safer roadways, motor vehicle accidents may never be totally eliminated in our car-oriented society. **However, you can minimize your chances of being seriously injured or killed should an accident occur by fastening your safety belt before every trip in a car.** Fastened safety belts prevent most second collisions and people collisions, and they keep you from being thrown out of the car during a crash.

How Safety Belts Provide Protection

The principles behind the protection safety belts provide can be illustrated by dropping one egg onto a hard surface and another egg onto a soft sponge. Upon hitting a hard surface, an egg receives the full force of impact on only a small area of its shell. This small area is not strong enough to sustain the great and sudden force of impact, and the egg breaks. But when an egg hits a sponge, the sponge compresses to absorb some of the impact forces and to distribute them over a larger area of the egg's shell.

Fastened safety belts function like the sponge in this illustration. During a crash, fastened safety belts distribute the forces of your rapidly decelerating body over a larger area of your body while stretching to absorb some of the forces. In addition, belts hold you in place while the car crushes and slows down. When the car stops moving, you are still moving but at a greatly reduced speed. The remaining forces of your deceleration are then absorbed safely by your body and the belts.

In short, you slow down with the car rather than continuing to travel at the same speed the car was travelling on impact. And, because you're being held in place by the belts, you won't be involved in a serious second collision, a person-to-person collision or ejection from the automobile.

What Fastened Safety Belts Can Do for You

There are two types of safety belts — the lap belt and the lap-shoulder belt. When fastened, each type provides specific protection in the event of an automobile crash.

In a crash, a fastened lap belt dissipates the deceleration forces of your body across your hips. A fastened lap belt keeps you inside the car and protects you from the risks of ejection. However, it may not prevent you from striking the windshield, steering wheel or dashboard — especially in smaller cars.

A fastened shoulder belt provides additional protection. It dissipates the deceleration forces over a larger area of the body than just the hips alone. A fastened shoulder belt prevents your head and chest from striking the car's interior.

Some cars have only lap belts, but most cars have lap-shoulder belt combination systems. A few cars have an automatic shoulder belt system that operates in combination with a knee bumper so that no lap belt is needed. But unless the car you're travelling in has this particular system, you should never use a shoulder belt without using a lap belt at the same time. During a crash without a lap belt or knee bumper to hold you in place, you could slide out from under the shoulder belt and be choked by it. For maximum protection, you should fasten the lap belt *and* the shoulder belt whenever both are available to you.

The sequential photographs at the right show how fastened safety belts provide protection during crashes. The occupant in the first sled test is a life-like dummy wearing a lap belt. The occupants in the second sled test are a human volunteer and a life-like dummy protected by lap-shoulder belt combination systems.

Occupant Wearing a Lap Belt

The first collision. This is a laboratory simulation of an accident in which two cars, each travelling at 30 mph, crash head-on.

Within 1/10 of a second, the vehicle has come to a complete stop. The upper torso and head of the occupant continue to pitch forward, but the lap belt restrains the lower portion of the occupant's body, dissipating the deceleration forces across the occupant's hips.

With only a lap belt, the occupant's head may strike the dashboard, but any injuries may not be serious because some forces are being dissipated by the belt and the occupant will return to an upright position.

Occupant Wearing a Lap-Shoulder Belt

Impact: This is a laboratory simulation of an accident in which two cars, each travelling at 17 mph, crash head-on. The human occupant continues to move forward, but the lap-shoulder belts keep him in his seat.

Collision at maximum. Here the forces of the collision are at their maximum. The occupant's stomach bulges as the safety belts strain to hold him back.

Less than 1/10 of a second after impact, the occupant returns safely to his original position.

Studies show
that
fastened
safety belts
are
effective

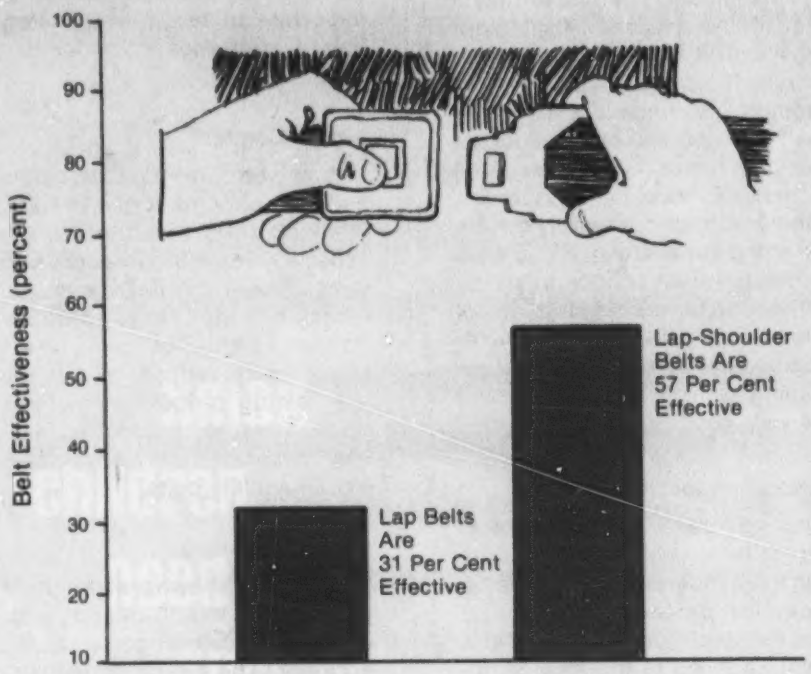
Laboratory studies using test cars crashed into concrete walls or sled tests clearly show that safety belts provide substantial protection for vehicle occupants under these controlled conditions. However, injury and death resulting from real-world accidents are the problems safety belts have been designed to prevent, and these crashes are more complex and uncontrolled than are laboratory crashes. Nevertheless, safety belts have been found to be highly effective in real-world accidents, too.

One of the problems in documenting the effectiveness of safety belts in real-world accidents has been the difficulty of collecting accurate and reliable safety belt usage data. To collect accurate data, the efforts of trained teams of accident investigators including engineers and doctors are required. Until recently, the services of such teams were not widely available. Previous studies of safety belt effectiveness, which relied on limited investigation reports for data, provided a wide range of belt effectiveness estimates.

Results of a Recent Study

Recently, a comprehensive study involving numerous trained accident investigation teams analyzed over 15,000 tow-away accidents in several widely separated areas of the United States. Because of the in-depth nature of this study, the resulting data on the effectiveness of safety belts in the real world is accurate and reliable.

The results of this study show that in preventing moderate to fatal injuries in real-world accidents, lap belts are 31 per cent effective and lap-shoulder belts are 57 per cent effective. *This means that if you are involved in a crash in which you are wearing a lap-shoulder belt, you are 57 per cent less likely to be injured or killed than if you are not wearing any safety belt.*



A recent comprehensive study showed that fastened safety belts are highly effective in preventing injuries and deaths in real-world automobile crashes.

Accident Prevention

Besides reducing the severity of injuries and the number of deaths when accidents do happen, fastened safety belts often keep minor accidents from becoming major ones and even prevent some accidents from happening in the first place. Without your safety belt fastened, a minor collision could throw you away from the controls when you're driving, and a more serious accident could occur when the car goes out of control. If you're driving without belts, a sudden swerve or a fast turn could cause you to slide across the seat and lose control of the car. In situations like these, your fastened safety belt will hold you in place behind the steering wheel so that you can maintain control of the car.

Accidents Involving Fire or Submersion

You may have heard that if you're involved in an accident resulting in fire or submersion in water, you may be trapped inside the car if you're wearing safety belts. In reality, the fears behind this myth have little basis in fact. Your chances of being involved in an accident of this type are extremely low since less than one-half of 1 per cent of all accidents result in fire or submersion of the vehicle. Even if fire or submersion does occur, it usually occurs *after* the initial crash. If you were protected from serious injury by safety belts during this initial crash, your chances of remaining conscious and capable of escaping from the car quickly would be very good.

Protection for Short Trips

You may believe that it's important to fasten your safety belt only for long trips at high speeds on freeways or turnpikes. This is another myth. Short trips of less than 25 miles to the local shopping center, around town or to work comprise about 95 per cent of all trips made. The facts are that three out of four accidents occur within 25 miles of home, 80 per cent of all accidents occur at speeds of less than 40 mph and the accident rate is much greater on city streets than on highways. Fatalities have been recorded at speeds as low as 12 mph — the speed you probably drive in the parking lot of your neighborhood supermarket. Since the more driving exposure you have the more likely you are to be involved in an accident, it's just as important to fasten your safety belt for short trips as it is for long trips.

Added Comfort

You may be convinced that safety belts are uncomfortable to wear. There may be some truth in this — especially for shorter people who want to wear shoulder belts. But most of the time, properly adjusted and properly worn safety belts reduce fatigue by maintaining proper driving and riding posture. Eventually, you may even feel *more* comfortable wearing safety belts.

During Pregnancy

Studies have shown that pregnant women are much safer if protected by safety belts in an accident. The American Medical Association's Committee on Medical Aspects of Automotive Safety has stated that "both the pregnant woman and the fetus are safer, provided the belt is worn as low on the pelvis as possible. The use of a shoulder strap in addition provides an extra safety factor."

Small
children
need
special
protection

To be safe when travelling in an automobile, small children need special protection. Careless habits can be especially dangerous to them. When you're in charge, it's your responsibility to see that small children travelling with you are not placed in high-risk situations.

With or without safety belts, you should never ride in either the front or the rear seat with an infant in your arms. In case of a sudden stop or collision, the infant could be thrown from your arms into the windshield or dashboard with great force. If you're involved in a second collision yourself, your body could crush the infant into some hard interior surface of the car.

Second collisions are just as dangerous to small children as to adults — and perhaps more so. For this reason, small children should not be allowed to kneel or stand on car seats, sleep in the rear window ledge or climb around in a moving car. Small children should not be allowed to travel unrestrained in an automobile at any time.

This is one of the few cases in which safety belts do not provide substantial protection: the pelvic bones of small children are not strong enough to withstand collision forces. Standard lap belts should not be used for children under the age of four or weighing less than 40 pounds. Children under 55 inches tall should not wear shoulder belts. The safest places for small children are in special restraint devices designed for them. These devices offer small children the greatest and most effective protection in the event of a crash.

Child restraints can be purchased from the parts departments of some new car dealers and in many retail stores. It's important to follow the manufacturer's directions for using the device to assure adequate protection for the child. For additional protection, small children in child restraints or bigger children who can use standard safety belts should ride in the back seat of the car.

Small children should not be allowed to travel unrestrained in an automobile at any time. These specially-designed child restraint devices offer small children the greatest and most effective protection in the event of a crash.

You can
help
to
increase
the use
of
safety belts
by
"spreading
the word"

If you've read through this booklet or even skimmed it carefully, you now know how dangerous travelling in a car can be. At the same time, you've become familiar with the most important and up-to-date facts about the protection fastened safety belts provide during automobile crashes. You know the facts this booklet has been designed to provide, and you can now consider yourself a "mini-expert" in the field.

With this knowledge, chances are good that you'll be protecting yourself from now on by fastening your safety belt before every trip in a car. You'll be practicing a sound safety habit — a habit more people need to develop for safety belts to have a real impact on the automobile crash injury and death toll in the United States.

Your help is needed. As a safety belt user, you can use your knowledge to encourage others to fasten their safety belts, too. Because you'll be setting a good example yourself, influencing others to join you in buckling up may be easier than you think.

The People Closest to You

The most logical place to begin using your knowledge and influence is with the people closest to you — your family and friends.

When you get into a car with others and especially if you're the driver, fasten your safety belt first and then ask everyone in the car to do the same. If your car has a starter interlock system, don't let it do all the work. Tell your passengers that fastened safety belts are a good idea. This is especially important for children and for teenagers who drive. If you can instill the safety belt habit in them at an early age, they will probably carry it with them all their lives. Along with some facts about safety belts, your family and friends may also like to hear that you're encouraging them to buckle up because you care about their well-being.

Using Your Personal Influence

Every day, you come in contact with many people through your job, groups you belong to or social situations. In each of these settings, there may be opportunities for you to use what you know to encourage others to use safety belts. Depending on your position, you may want to start a safety belt education program at work or suggest that one be started. If you have or can get floor time in groups you belong to, you may want to make safety belts the topic of a presentation or group discussion. There may be an opportunity for you to volunteer to give a presentation on safety belts for a school class or to encourage children or teenagers in your family to use safety belts as the basis for a project or theme for school. In social situations when the subject comes up, the facts and statistics you've learned from reading this booklet may be very interesting to other people.

Using your personal influence to encourage others to use safety belts will take some thought and action on your part. But the facts in this booklet encouraged you, and you can use them in turn to encourage others. Starting a program at work, leading a group discussion, giving a presentation for a group and other formalized situations will, of course, require planning on your part. The following information and suggestions can aid you in encouraging others to use safety belts when you're required to do so in a formalized situation.

Who May Be Influenced

In a study conducted to find out who does and doesn't use belts and why, a nationally representative sample of about 2,000 drivers were interviewed. The results of the study showed that while 90 per cent of these drivers were aware of the benefits of fastened safety belts, only about 17 per cent always fastened their belts.

In general, safety belt users fall into three categories: the "always" users, the "sometimes" users and the "never" users. "Always" users wear safety belts for protection, because they formed the habit and because

belts provide a feeling of assurance. "Sometimes" users are influenced by the perceived danger of individual trips. They wear their belts on longer trips that involve higher speeds and when they have to drive under hazardous conditions. "Never" users don't wear belts because they never formed the habit, because belts are uncomfortable and inconvenient to use and because they doubt the value or effectiveness of safety belts. Obviously, "sometimes" and "never" safety belt users often base their decisions about belts on misperceptions or a lack of knowledge. These people can often be persuaded by well-documented facts such as those presented in this booklet.

This same study and several others have found that belt usage is not related to age or sex. However, as the age and length of ownership of a particular car increase, the likelihood that the car's owner will wear safety belts decreases. Studies have also found that "always" safety belt users are likely to be well educated, to be graduates of some type of driver education course and to be non-smokers.

In terms of personality, safety belt users tend to be more logical and less emotional than non-users and also more methodical, orderly and precise. In general, safety belt users are not fatalistic, claustrophobic or concerned with "putting up a good front." Also, they are less likely to resist technological innovations.

Some "Do's and Don'ts" in Approaching an Audience

Presenting the facts about safety belts in a variety of ways over a long period of time is the ideal way to influence people to use belts. This may be possible if you're starting or planning a program at work, but it will not be possible in a one-time discussion. To increase the effectiveness of one-time discussions or presentations, you should plan to keep them as varied as possible and to pass out some safety belt literature for the audience to take home.

Using "scare techniques" such as gory pictures is not an effective way to encourage people to use safety belts. After an audience has been exposed to such techniques, they often associate safety belts with the shocking material they saw. Then, the likelihood that they will fasten their belts becomes even less. Discussion of the dangers of travelling without safety belts is necessary in any safety belt presentation, but this information should be followed by an explanation of the many ways in which fastened safety belts alleviate the danger.

The following approaches or variations of them could be used effectively to encourage people to wear safety belts:

"Although many people don't stop to think about it, wearing safety belts is a smart thing to do." More people are wearing safety belts now than ever before. Wearing safety belts doesn't show a lack of confidence in your (or anyone else's) driving ability.

"Wearing safety belts shows that you're a responsible person." When you wear safety belts, you're showing consideration for yourself as well as for others. You're taking positive action to remain uninjured and alive and to prevent needless tragedy for yourself, your family, your friends and society.

"Wearing safety belts and encouraging others to wear them shows you care." When you know what can happen to people in automobile accidents and how safety belts provide protection, you realize how dangerous *not* wearing belts really is. When you fasten your safety belt, you're taking good care of yourself. When you encourage others to fasten their belts, you're showing that you care a great deal about them.

If you're not
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